DOCUMENT RESUME

ED 180 178 EC 122 520

AUTHOR DiScipio, William J.: Nardi, Thomas J.
TITLE Demographic and Clinical Correlates of Gains in Reading, Spelling and Arithmetic Obtained at a Hospital-Based Children's Psychiatric Center.
PUB DATE Mar 78
NOTE 18p.: Paper presented at the National Association of School Psychologists (New York, NY, March, 1978); Print may be marginal on some pages.

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement: *Arithmetic: Elementary Secondary Education: *Emotionally Disturbed; Exceptional Child Research: *Psychiatric Hospitals: *Psychoeducational Clinics: *Reading Ability: *Spelling

ABSTRACT

Fifty students (ages 7 to 16 years) attending a children's psychiatric center's psychoeducational program were assessed for achievement levels in reading, spelling, and arithmetic on admission and for gains made during the program. Among results were that students who stayed in the program 12 months or less made significantly more gains on pooled achievement scores than those who stayed in the program longer, and low arithmetic achievers later showed significantly greater prorated gains than the high arithmetic achievers. Greatest overall gains were in arithmetic, and reasons for this occurrence are discussed. (Author/PHR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED180178

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

DEMOCRAPHIC AND CLINICAL CORRELATES OF GAINS IN READING, SPELLING AND ARITHMETIC OBTAINED AT A HOSPITAL-BASED CHILDREN'S PSYCHIATRIC CENTER.*

by

William J. Di Scipio, Ph.D., Director of Psychology Department, Bronx Children's Psychiatric Center Bronx, New York 10461, and Assistant Clinical Professor of Psychiatry, Albert Einstein College of Medicine Bronx, New York

&

Thomas J. Nardi, Ph.D., Supervising School Psychologist, Bronx Children's Psychiatric Center, Bronx, N.Y. 10461, and Adjunct Assistant Professor, Pace University Pleasantville, New York

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
William Di Scipio
Thomas J. Nardi
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

EC 122520

*Paper presented at the 1978 National Association of School Psychologists, New York City, March 1978

Summary

Fifty students attending a children's psychiatric center's psychoeducational program were assessed for achievement levels in reading, spelling and arithmetic on admission and for gains made during attendance in the program. Results are explained in relation to educational program, psychometric limitations of the WRAT and cognitive processes.

Bronx Children's Psychiatric Center is a State supported facility specifically designed to deal with both clinical and educational needs of children in an urban, predominantly low income, ethnic minority neighborhood. Children are admitted to the Center's full-time psycho-educational program because of exclusion from all other public, private and residential school systems. They present the full range of psychiatric diagnoses with the exception of primary mental retardation. Behavior disorders and deficient social skills are prevalent among the children. They are therefore exposed to an intensive classroom and individualized remediation program as well as various psychotherapeutic modalities.

The purpose of this study is to provide objective criteria for documentation of progress of learning disabled children when exposed to a multidisciplinary program. Demographic and clinical characteristics as they relate to academic achievement were examined without regard to educational or programmatic methods and content.

Method

Demographic and Clinical Description of the Sample:

A sample of 50 children were selected from the first 4 years of the Center's program. The sample was selected on the availability

of at least two psycho-educational reports. Pre-testing was performed within two weeks of the time of admission. The retest was defined as the most recently available scores from the Center. The mean retest interval was 12.94 months (SD = 9.10). There were 34 boys and 16 girls. The mean age was 11.96 years (SD = 2.11) with a range from 7.0 to 15.7 years. Twenty-eight students were assigned to the Children's Unit (under 12 years) and 22 to the Adolescent Unit (12 to 16 years). Whites comprised 9 students, Hispanics 24 and blacks 17. The mean length of stay for resident and day care children was 20.28 months (SD = 11.12). No sex differences were found for length of stay. Fourteen students were diagnosed organic and 36 non-organic.

Measures of Academic Achievement:

A complete Wide Range Achievement Test (WRAT) (Jastak & Jastak, 1965) was used for pre- and post-measures. The sample of 50 students represents approximately 13% of all students passing through the school for the four-year study period. Reliability coeffecients for clinical populations are given in the WRAT manual (p. 14) as ranging from .90 to .95. The following derived scores were used:

a) Grade Level Scores - School grade equivalent based upon transformation of raw scores as given in the WRAT manual.

b) Prorated Gain Score - The difference between the pre- and post-test grade level scores divided by the test-retest time interval and multiplied by 10 months (school year). While prorated gain scores between any two consecutive school years are not considered "equivalent" these scores are computed for the purpose of program comparisons and not useful individual estimates of change.

Results

WRAT Admission and Gain Scores:

The mean admission grade level scores for the full sample (N = 50) were: Reading = 3.6 (SD = 2.9), Spelling = 3.4 (SD = 2.4), and Arithmetic = 2.6 (SD = 3.9). The Reading and Spelling scores were 25 months below expected grade level while the Arithmetic score was 35 months below expected grade level. The average prorated gain scores for Reading, Spelling and Arithmetic were 15 months, 9 months and 19 months, respectively. Results for children and adolescents are presented in Tables 1 and 2.

Insert Table 1 and 2 about here.

Neither sex nor ethnic comparisons were significantly different. Students who stayed 12 months or less made significantly more gains on pooled achievement scores than those who stayed in

the program longer. Organics scored significantly lower than non-organics on Reading and Arithmetic pre-tests. Average Arithmetic scores for the combined first and second years of the program were significantly higher than the scores for the third and fourth years. Pro-rated gain scores, however, were significantly lower in the first and second years than in the third and fourth years.

Comparison of High and Low Achievers in Relation to Gains: Table 3 summarizes the comparisons of highest achievers as defined by the top ten admission grade level scores with the lowest achievers (bottom ten scores) for children. Table 4 summarizes the comparisons for adolescents. These comparisons are based upon the entire four year evaluation.

Insert Tables 3 and 4 about here

In both children and adolescent groups, the low Arithmetic achievers later showed significantly greater pro-rated gains than the high Arithmetic achievers. The children's group also showed a differential reading gain with high achievers showing more gains than low achievers.

The high and low achiever groups were matched

for ethnic differences, test re-test interval and length of hospital stay. Differences emerging significant were sex and diagnosis. For the children's group, twenty-nine of the thirty low achievers (Reading, Spelling and Arithmetic combined) were boys while only 17 of the high achievers were boys ($x^2 = 13.42$; df = 1; $p < .001$). Twenty-two of the low achievers were organics while 10 of the high achievers organics ($x^2 = 9.64$; df = 1; $p < .01$). For the adolescent group, six of the low achievers were organic while only one of the high achievers was organic ($x^2 = 4.04$; df = 1; $p < .05$).

Discussion

The 15 month overall gain in Reading found in our sample is more than twice the rate of gain cited by Becker (1975) in a study of economically disadvantaged children, and about three to four months greater than the sample in Becker's "direct instruction method" project. Arithmetic gains exceed Becker's special program sample by about 9 months. (Comparisons for Spelling gains are not possible because Becker did not provide these scores).

Becker's program differs from ours in that Becker described an effort to apply an operant learning model, as well as provide continuous feedback of results to teachers and children. Our program emphasized greater autonomy for each individual teacher in the

absence of both a generally accepted model of educational planning and continuous program feedback. While a close matching of teacher-student ratios in both programs (1:7) would not account for outcome differences, it is difficult to identify objective program criteria which could account for our superior results. Perhaps the greater degree of flexibility in our program in allowing teachers to establish their own educational procedures, in addition to the "wholistic" view of the child, closely supported by a clinical-professional staff during the psycho-educational program, contributed to the superiority of our results.

An analysis of overall comparative gains in Reading, Spelling and Arithmetic in our study revealed no significant differences. While the differences among these means appeared salient, the standard deviations of scores were large, thus underscoring great variability. Therefore, our educational program may appear to meet or exceed both national standards and Becker's special program standards when comparing mean scores. The clinical

absence of both a generally accepted model of educational planning and continuous program feedback. While a close matching of teacher-student ratios in both programs (1:7) would not account for outcome differences, it is difficult to identify objective program criteria which could account for our superior results. Perhaps the greater degree of flexibility in our program in allowing teachers to establish their own educational procedures, in addition to the "wholistic" view of the child, closely supported by a clinical-professional staff during the psycho-educational program, contributed to the superiority of our results.

An analysis of overall comparative gains in Reading, Spelling and Arithmetic in our study revealed no significant differences. While the differences among these means appeared salient, the standard deviations of scores were large, thus underscoring great variability. Therefore, our educational program may appear to meet or exceed both national standards and Becker's special program standards when comparing mean scores. The clinical

nature and small size or our sample probably contributes, however, to much greater heterogeniety of variance than obtained by the above cited normative groups.

As might be expected, the relationship between presence of organicity and low achievement held true for both age groups of students. On the other hand, gains for organic and non-organic groups were not significantly different, suggesting either than emotional disturbances are as disruptive of the learning process as organicity, or that our program is equivalent in relation to its efficacy with both groups. The further discriminating sex difference which appeared in the children's group is consistent with the general finding that incidence of organicity in boys is greater than girls (Bentzen, 1966).

Conclusion

The differential gain effect might be attributed to at least three major areas of influence: 1) teacher, 2) psychometric limitations and 3) cognitive hypotheses.

The teaching of arithmetic may unintentionally be more concentrated in our program than teaching of reading of spelling. A survey of our teachers, however, suggests no curriculum based

emphasis on any one subject area.

The psychometric limitations of the WRAT itself may have influenced the differential gain effect. The WRAT may be more sensitive to improvement in Arithmetic than Reading or Spelling. The correspondence between what is taught and what is measured may also be greater for Arithmetic. That is, the content validity for the Arithmetic subtest may be higher than for other subtests. It is particularly noted that the Reading subtest obscures the complexity involved in teaching comprehension and other Reading skills.

The rate of grade level increments is greater on Level I of the WRAT than on Level II. Thus younger children's correct responses will weigh more in grade level conversions than older children's. Similarly, a "ceiling effect" may be occurring, particularly with the low Arithmetic scores. The students who are initially very low will have a greater potential increase in order to reach grade level than those students already closer to grade level.

Scoring of Arithmetic is perhaps less subject to examiner error than Reading. The WRAT manual notes that the student may "skim over the words or produce a response that sounds superficially correct". Furthermore, since the Arithmetic subtest is predominately written in format it is easier to avoid scoring errors.

Our cognitive hypotheses are offered somewhat tentatively. Arithmetic may be a less complex task than Reading for our population. Numbers may be more easily understood than abstract linguistic concepts. There are only four basic processes in Arithmetic which, once learned, can easily be applied to most of the Arithmetic test items. Arithmetic may also be seen as a more exact subject without confusing exceptions to "rules" as in Reading or Spelling.

In conclusion, it is apparent that WRAT measures of achievement can easily be influenced by a number of environmental as well as psychometric and clinical variables. None of the explanations in relation to the surprising differential gains in Arithmetic were sufficient in identifying the causal factors in this finding. However, should the findings of this study prove replicable in similar clinical samples, implications for curriculum planning and classroom selections are apparent.

References

Becker, W.C. Some effects of direct instruction methods in teaching disadvantaged children in project Follow Through. In: Applications of Behavior Modification, (Thompson, T. & Dockens, W. S. III, Eds.) New York: Academic Press, 1975

Bentzen, F. Sex ratios in learning and behavior disorder. The National Elementary Principal, 1966, 46, 13-17.

Jastak, J.F. and Jastak, S.R. The Wide Range Achievement Test - Manual, Wilmington: Guidance Associates of Delaware, 1976.

Table 1

Children: Admission Grade Level Scores

and Prorated Gains

(N = 22)

	Reading	Spelling	Arithmetic
Admis. Grade Level (mos.)			
Mean	2.05	2.06	2.09
SD	(1.54)	(1.41)	(1.39)
Prorated Gains (mos.)			
Mean	5.73	7.45	13.00
SD	(7.01)	(13.69)	(10.66)

Table 2

Adolescents: Admission Grade Level Scores and Prorated Gains (N = 22)

	Reading	Spelling	Arithmetic
Admis. Grade Level (mos.)			
Mean	4.94	4.45	3.10
SD	(3.25)	(2.75)	(.99)
Prorated Gains (mos.)			
Mean	27.68	9.68	48.10
SD	(61.25)	(27.09)	(22.12)

Table 3

Comparison of High and Low Achievers

for Prorated Gain Scores for Children

		Reading	Spelling	Arithmetic
High Achievers	Mean	7.60	7.20	8.80
	SD	(9.50)	(2.66)	(4.64)
Low Achievers	Mean	2.70	5.60	13.70
	SD	(2.26)	(4.60)	(7.21)

Table 4

Comparison of High and Low Achievers

for Prorated Gain Scores for Adolescents

		Reading	Spelling	Arithmetic
High Achievers	Mean	9.80	8.30	4.30
	SD	(8.94)	(10.81)	(13.82)
Low Achievers	Mean	10.40	12.60	34.00
	SD	(18.81)	(25.17)	(29.80)